R.V. FRANKLIN

NATIONAL FACILITY
OCEANOGRAPHIC RESEARCH VESSEL

CRUISE SUMMARY

R.V. 'FRANKLIN'

FR 7/86

For further information contact

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AUSTRALIA

R.V. FRANKLIN IS OWNED AND OPERATED BY CSIRO

Cruise Summary
R.V. FRANKLIN
FR 07/86

SCIENTIFIC PROGRAM

1. Erosion and deposition of sediment in Bass Canyon and adjacent abyssal fans.
2. Late-Quaternary sedimentary history of Bass Basin.
3. Seamounts of the Tasman Sea: Geochronology, geochemistry and origin.

PRINCIPAL INVESTIGATORS

1. Dr. C.J.Jenkins,
Ocean Sciences Institute,
University of Sydney, NSW, 2006.
Tel:(02)692-4068

2. Dr.J.B.Keene
Department of Geology and Geophysics
University of Sydney, NSW,2006.
Tel:(02)692-2915

3. Dr.I.McDougall,
RSES
A.N.U., GPO Box 4,
Canberra, ACT 2600.
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Prof.D.H.Green,
Department of Geology
University of Tasmania
GPO Box 2524
Hobart, Tas, 7001.
Tel:(002)202-103

ITINERARY

Depart	Hobart	1020hrs	Friday	5-Sep-86
	Devonport	1400hrs	Monday	8-Sep-86
	(Disembark J.Peterson, P.Tildesly.)			
Arrive	Port Kembla	2300hrs	Thursday	11-Sep-86
	(Repairs to main winch.)			
Depart	Port Kembla	0900hrs	Saturday	13-Sep-86
Arrive	Sydney	1100hrs	Saturday	20-Sep-86

CRUISE OBJECTIVES ACHIEVED.

The objectives of the cruise were only partially achieved. This was due in part to bad weather and winch problems and partly because of the steaming distances involved left little time for station work. A total of 2,162 nautical miles were steamed (Fig 1.). Forty stations were occupied at depths varying from 32m in Bass Strait to 4150m on the abyssal plain. Locations are shown in Figure 1. The towing winch was used for all station operations. Breakdown of sampling operations by types of gear is as follows:

Camera	7.
Grabs	24.
Gravity core	1.
Piston core	7.
Dredge	9.

Underway data collected included bathymetry, sea surface salinity and meteorological observations. Side-scan Sonar was deployed for 13 hours for survey lines at 2-4 knots in water depths up to 60m.

TIME ALLOCATION FOR WHOLE CRUISE

Steaming	7.8 days
Stations,side-scan sonar	3.6 days
Weather	1.6 days
Winch Breakdown.	2.0 days
	15.0 days

Project 1

All five deep water camera runs were successful and the photographs obtained will help identify seafloor environments on the continental slope and abyssal plain. Only two cores were attempted: a gravity core was unsuccessful probably because the winch-out speed is too slow (40 m/min) whereas the piston corer was successful and obtained 2.25m of core in 1274m of water. This project suffered more than others from the winch breakdown because the breakdown occurred on the first station in Bass Canyon and the trip to Port Kembla for repairs meant that the principal objective of sampling and photographing the canyon and fan had to be abandoned. Continental slope stations off Port Kembla and Smokey Cape were substituted for those missed to ensure the collection of some useful data for this project

TIME ALLOCATION

Station	25 hours
Steaming	56 hours
Weather	22 hours
	103 hours (4.3 days)

Project 2

The objectives of this project were met. Six piston cores up to 4.5m long were obtained from Bass Basin (Fig. 1), together with grab samples and one camera run. A detailed survey of an area of submarine sand dunes was carried out north of Flinders Island. The side-scan sonar was deployed from the davit on the starboard side and towed at 2-4 knots. The results were above expectations and enabled the orientation of dune crests to be plotted and confirmed the presence of active mega-ripples on the flanks of the dunes. Nineteen grab samples consisted of medium to coarse calcareous sand from the dunes and calcareous sandy gravel from other areas between the dunes. One successful camera run was done over several 10m high dunes at the same time as the Side

Scan Sonar records were being collected.

TIME ALLOCATION

Station and side-scan sonar	26 hours
Steaming	25 hours
Weather	0 hours
	51 hours (2.1 days)

Project 3

Nine dredging stations were attempted at depths down to 3040m in order to collect basalt samples from four seamounts (Fig. 1). Only two dredges obtained substantial quantities of basalt: one from Britannia Seamount and one from Moreton Seamount. Manganese crusts were also collected. Limestone samples were dredged from Stradbroke Seamount and small sediment samples were obtained at six of the dredge stations. The dredge, together with approximately 1800m wire, was lost at the last dredge station on Moreton Seamount. Because of bad weather the station planned for Barcoo Seamount was abandoned.

TIME ALLOCATION

Station and site survey	37 hours
Steaming	104 hours
Weather	17 hours
	158 hours (6.6 days)

BRIEF SUMMARY OF CRUISE

R.V. FRANKLIN sailed from Hobart at 1020 hours (EST) on 5 September 1986. The first station was reached at 1730 hours but abandoned because of bad weather and the ship took shelter in the lee of Maria Island. The following day a camera station was possible but it was still too rough for coring. After passing through Banks Strait the side-scan sonar was deployed for a successful test run. Piston coring and grab sampling progressed smoothly in Bass Strait interrupted for about 3 hours to transit to Devonport to put ashore J. Peterson and P. Tildesly (CSIRO - Division of Oceanography). Side-scan sonar lines, grab sampling and a camera run were all completed north of Flinders Island on 9 September. On 10 September during retrieval of the camera from the first station in Bass Canyon the hydraulic "powerpac" to the towing winch seized. It was some fourteen hours before 2900m of wire and the camera were retrieved; all in good condition. Further sampling in this area was abandoned and the ship steamed for Port Kembla to enable repairs to be made to the winch. Arrived at Port Kembla 2330 hours 11 September and depart 0900 hours 13 September. A camera and piston core station on the continental slope off Wollongong was successful and the winch gave no trouble. On arrival at Barcoo Seamount on 14 September rough seas prevented dredging. A short bathymetric survey was carried out in

the hope the seas would abate but to no avail and the station was abandoned. Two dredge stations on Stradbroke Seamount (15 September) sampled limestone and on 16 September three dredge stations on Britannia Seamount resulted in one good haul of basalt with manganese crust and some sediment. Currents up to 3 knots were measured using GPS navigation and made dredging difficult. Moreton Seamount was reached on 17 September and two unsuccessful dredges were made before rough seas prevented further work. To occupy this time a bathymetric survey was made of an un-named seamount to the south. The first of two dredge attempts on 18 September resulted in weathered basalt and manganese crust, however during the second the dredge hung-up and the wire parted some 150m below the ship with the loss of the dredge and about 1800m of wire. This ended dredging operations. A high priority should be given to the provision of a functioning tensionmeter in both the Operations room and the winch control station to help reduce the danger of loss of gear, especially during dredging. At Smokey Cape on 19 September a near-shore side-scan sonar survey was run to delineate sand bodies. This was followed by a camera station on the upper continental slope before transit to Sydney.

PERSONNEL

Dr. J.B. Keene	University of Sydney (Chief Scientist)
Dr. I. McDougall	A.N.U.
Dr. C.J. Jenkins	University of Sydney
Dr. P. Harris	University of Sydney
Ms. W. Blom	University of Sydney
Mr. S. Eggins	University of Tasmania
Mr. J. Garces	University of Sydney
Mr. M. Malikides	University of Sydney
Mr. D. Vaudrey	CSIRO Oceanography (Cruise Manager)
Mr. A. Poole	CSIRO Oceanography (Electronics)
(Hobart-Devonport only)	
Ms. J. Peterson	CSIRO Oceanography
Dr. P. Tildesly	CSIRO Oceanography

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Dr. J.B. Keene
Chief Scientist

Mr. D.J. Vaudrey
Cruise Manager

APPENDIX- EQUIPMENT REPORT

1. General- J. Keene

1. Main Towing Winch.

On one occasion the winch started freewheeling out when the winch driver changed from the bridge to the deck. This could have been disastrous as there was a camera, strobe and pinger on the wire. The time lost when the hydraulic "powerpac" coupling breakdown was minimised only because of the skill and efforts of the Master, Engineers and and ship's crew.The Tension Gauge was not operational. A chart record of the tension is essential when dredging and coring.

2. Hydrographic Winch.

This was out of commission when we left Hobart. It would have saved time using it for the grab sampling.

3. Echo Sounder.

Functioned well but insufficient details are obtained in water greater than 4000m. The pinger return was often too weak, particularly with bow thrusters on. This made some camera stations difficult. A low frequency (3.5Khz) bottom profiler would be very useful for deepwater work.

4. Navigation .

The Satellite navigator was down for one short period. D.R. positions were sometimes out by 3 or 4 nm when compared with GPS. GPS was received on 8 days for periods ranging from 2 to 6 hours. A top priority should be to have navigation plotted in real time, back corrected when the next satellite comes in. Repeaters for the gyro, log and Satnav should be installed in the Operations Room rather than the computer derived display currently available.

2. Computing Report - D.Vaudrey

1. VAX

The VAX worked well for the duration of the Cruise accepting three occasions where the temperature cut-out operated. The VAX was restarted on each occasion with little trouble.

2. MICRO 1

The MICRO 1 tape drive failed to correctly unload the first MTSPOL tape of the cruise due to the reel hub pads not retracting. Subsequent loads were impossible. This was cured very simply following advice from Hobart.

3. MTSPOL.

The new MTSPOL program suffered a failure and after much thought was restarted by rebooting MICRO 1. The cause of the failure may have been an ABO NAV, an attemptto clear a MET display hang up of DR position. As this happened at a time when MTSPOL was waiting for a new tape the fault became terminal. Restaring by conventional methods proved beyond the understanding of those

on board. Subsequently MTSPOL ran faultlessly although improved prompting is required to assist tape labeling.

4. G.P.S.

Jan Peterson wrote two programs for the project scientists to access GPS data but these proved to be unwieldy considering that GPS was available for only about 3 hours per day and for real time navigation 10second positioning was overkill. Dave Vaudrey wrote a small program to read GPS.DAT on [CROOKS.CRUDAT] and list every sixth record. These data were listed for the project scientists. Some improved method of getting GDOP predictions should be considered.

5. NAV-MET Display.

Navigation logging progressed well although some data may have been lost during reboots and restarts. Occasional hangups in the NAV occured in conjunction with satellite fixes. These were solved by ABO NAV and NAV (carried out between MTSPOL taping data as a precaution). Loss of navigation information on the MET display was frustrating and could usually be tracked down to either the Bridge using the INTECH or MICRO 1 being busy, processing a satellite fix or MTSPOL taping a number of files. Unfortunately not all hangups could be traced. Some were terminal, some were not.

3. Electronics - Alan Poole

1. Simrad EK400 sounder.

The Simrad sounder performed well the entire cruise. A minor problem was encountered with the synchronisation correction when on 0-250 scale. This did not cause any inconvenience.

2. Trimble GPS Locator.

Initially we had some difficulty obtaining fixes. Due to prevailing satellite conditions we were only getting one period of satellite fixes a day. The problem was solved by reinitialising the system just prior to the satellite period. I suspect that with the lengthy period between fixes the ship had moved a distance too far forthe instrument to cope.

3. Acoustic Doppler Current Profiler.

The bit code errors that occurred on the previous cruise did not reoccur when the unit was tested and it appears to be functioning normally.

4. INTECH satelite navigator.

The INTECH began behaving oddly which was traced to incorrect interpretation of keyboard commands. This was traced to a faulty I/O interface chip on the main CPU board. The chip was swapped with one from the Omega CPU board and no further problems occurred.

5. Thermosalinograph.

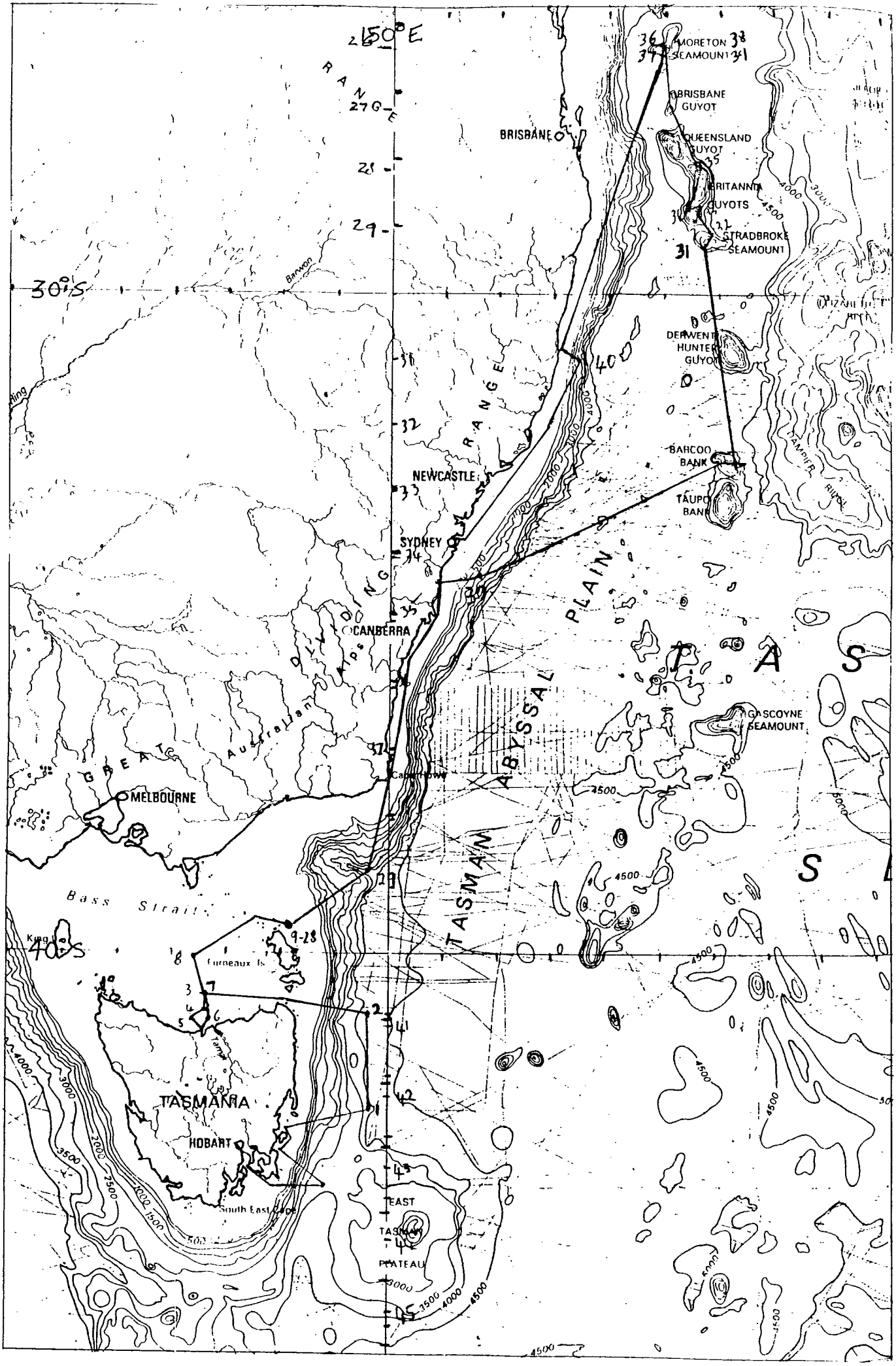
The water intake for the instrument has been shifted to the engine cooling intake. This has resulted in the unit being operational in the roughest of weather. The temperature sensor will be moved to the new intake before my return to Hobart.

6. General Oceanics Block.

Apart from the load cell which is not operational the instrument performed well during the cruise.

7. Benthos Pinger.

This performed faultlessly the entire cruise.


150°E
27°E
28
29
30°S
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MORETON SEAMOUNT
BRISBANE GUYOT
QUEENSLAND GUYOT
BRITANNIA GUYOTS
STRADBROKE SEAMOUNT
DERWENT HUNTER GUYOT
BARCOO BANK
TAUPO BANK
BRISBANE
NEWCASTLE
SYDNEY
CANBERRA
MELBOURNE
GASCOYNE SEAMOUNT
GREAT Australian DIVIDING RANGE
TASMAN ABYSSAL PLAIN
Bass Strait
King I.
Furneaux Is.
TASMANIA
HOBART
South East Cape
EAST TASMAN PLATEAU
Barwon
Tamar
Cape Howe
4000
3000
3500
2000
2500
1500
4500